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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/530,077	09/22/2005	Marcos Giovani Dropa Bortoli	04306/0202707-US0	7459

7278 7590 12/20/2007

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EXAMINER	
KASTURE, DNYANESH G	
ART UNIT	PAPER NUMBER
4147	

MAIL DATE	DELIVERY MODE
12/20/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/530,077	BORTOLI ET AL.	
	Examiner	Art Unit	
	DNYANESH KASTURE	4147	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 September 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-8* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-8* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *01 April 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *01 April 05*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Priority

1. Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d). The certified copy has been filed in parent Application No. PI 0204413-7, filed on 10/9/2002.

Specification

2. The abstract of the disclosure is objected to because it is too long. Correction is required. See MPEP § 608.01(b).

Claim Objections

3. Claim 5 is objected to because of the following informalities: The use of the word "intensely" in line 10 is ambiguous. It is suggested that the word "rapidly" be used if the intent is to claim the decreasing nature of the slope of the curve starting with a vertical maximum at the apex. Appropriate correction is required.

4. Claim 7 is objected to because of the following minor informalities: Line 24-25 presently reads: "where C is an extension of the higher bending region". The following change is suggested: "where C is measured along the horizontal axis of the higher bending region".

5. Claim 8 objected to because of the following minor informalities: Line 29 presently reads: "A suction valve, according to claim 1 and in which the flexible vane (10) is cut from a support blade". The following change is suggested: "A suction valve, according to claim 1 in which the flexible vane (10) is cut from a support blade".

Claim Rejections - 35 USC § 112

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claim 7 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

8. In Re claim 7, the applicant has not disclosed how the coefficients “a”,”b”,”c” and “d” are determined from the rigidity and bending parameters of the flexible vane. Further, the specification discloses one set of values for these constants however it does not disclose what the corresponding values of the rigidity and bending parameters are.

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

10. Claims 1, 5 and 8 are rejected under 35 U.S.C. 102(b) as being anticipated by Ikeda et al (US Patent 4,764,091 A).

Fig. 5A

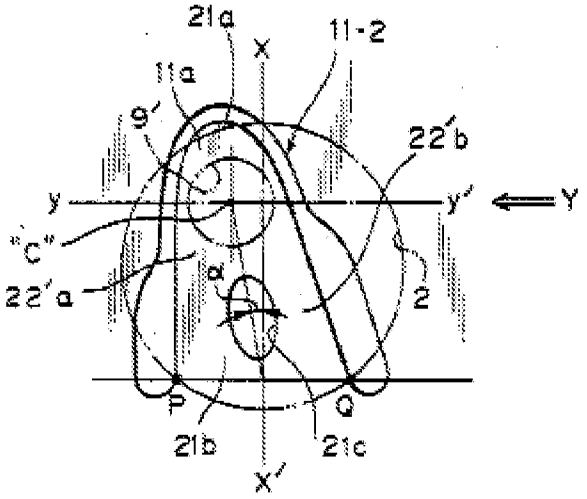
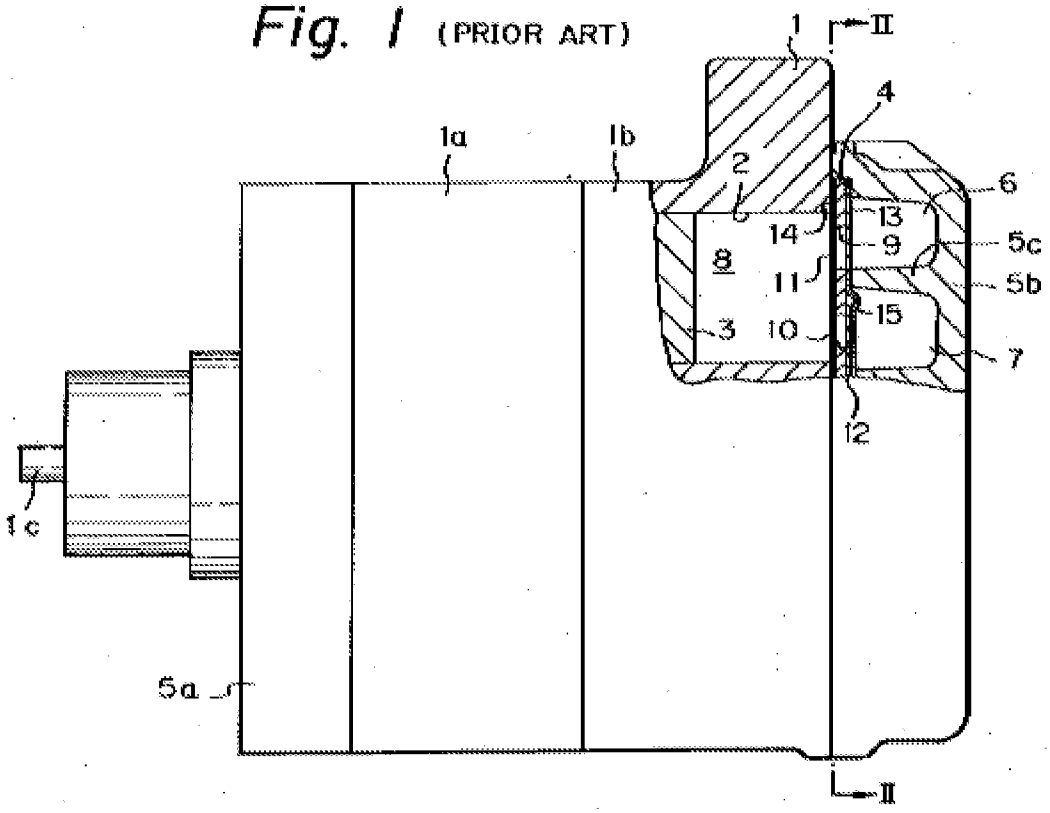


Fig. 1 (PRIOR ART)



11. In Re claim 1, with reference to Figures 5A and Figure 1, Ikeda et al discloses a suction reed valve described as:

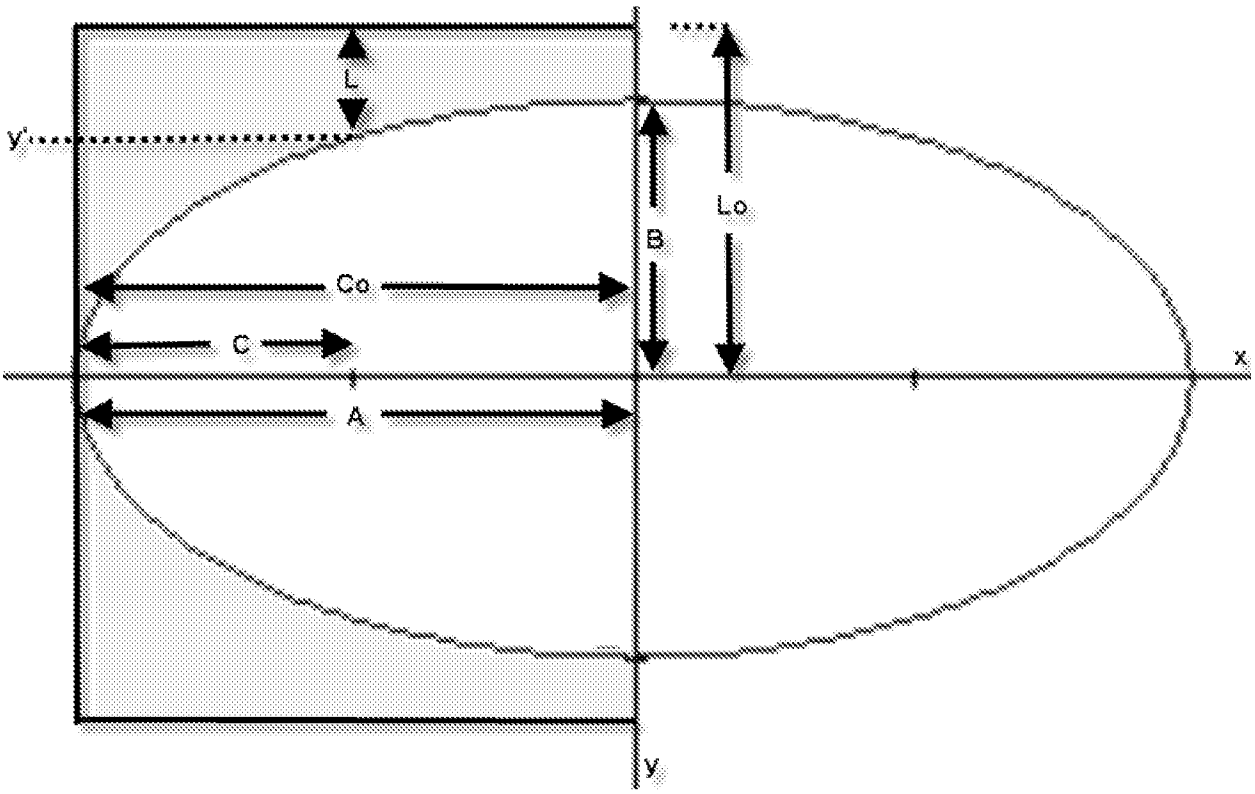
- whose end is closed by a valve plate (4)
- a flexible vane (11) which is disclosed as suction valve disc made of an elastic steel plate (column 4, line 34)
- a fixation portion in the vane defined by the arc segment around points connecting points P and Q
- a bending median portion defined by a section of the valve between tangential lines at the tips of the ellipse parallel to a line drawn through points P and Q
- a discharge orifice (10)
- a suction orifice (9)
- a sealing end portion defined by a section around line y-y' of the valve beyond the elliptical section.
- the distance between the external and internal edge diminishes from a maximum near the fixed end P-Q to a minimum at the half way point of the elliptical opening.
- The outline of the vane from point P to point Q along its edge presents a "U" shape.

12. In Re claim 5, Ikeda et al discloses an elliptical shaped opening where the slope of the internal edge inherently decreases more rapidly starting at the apex of the ellipse. As a result the thickness L also decreases more rapidly close to the apex of the ellipse.

13. In Re claim 8, Ikeda et al discloses a gap that is larger at the fixed end of the vane than at the apex. Note that in accordance to MPEP 2113, the method of forming the flexible vane (by cutting from the support blade) is not germane to the issue of patentability of the device itself.

14. Claim 7 is rejected under 35 U.S.C. 102(b) as being anticipated by Ikeda et al (US Patent 4,764,091 A) as extrinsically evident from Schulze (US Patent 6,823,891 B2).

15. In Re claim 7, the embodiment that applicant discloses in the specification by giving numeric values to the polynomial equation may infringe on prior art in specific areas of the high bend region. For example, a specific ratio of width of the elliptical opening to the total width (B/Lo) = 66.48 % is inherently used by Schulze in Column 4, Line 58 and 59 (which enumerates the OD = 2.449, ID = 1.628 and therefore the ratio of ID/OD = 1.628/2.449 = 0.66476).



16. The above figure is a depiction of a high bend region formed by an area between the rectangle and the elliptical contour. To simplify calculation, the horizontal edges of the rectangle form the edges of the valve. Applicant discloses the width of the high bend region for one embodiment specifying a set of values for “a”, “b”, “c” and “d". Applicant also discloses that a deviation of 20 % is also adequate. Based on the values of these constants, a sample calculation was made for the value of L/Lo corresponding to the midpoint of the high bend region (C/Co = 0.5) and associated +/- 20 % tolerance:

When C/Co = 0.5, L/Lo = 0.432063 (tolerance within 0.34565 and 0.518475)

Following is a standard equation of an ellipse:

$$y' = B * \sqrt{(1 - (x^2 / A^2))}$$

Plugging in x = A/2 for the midpoint of the high bend region, and solving for y', we have:

$$y' = ((\sqrt{3}) / 2) * B$$

Since L = Lo – y' from the figure, we can substitute for y' from the above equation to get:

$$L = L_0 - ((\sqrt{3}) / 2) * B$$

Substituting L = Lo * 0.432063 from the calculation on the applicant's data, we have:

$$L_0 * 0.432063 = L_0 - ((\sqrt{3}) / 2) * B$$

Simplifying the above equation and solving for B/Lo yields:

B/Lo = 0.655797 = 65.58 %

This is almost the same as the 66.48 % as inherently used by Schulze. A slightly different value of L/Lo, that is well within the 20 % tolerance, would have yielded the exact same percentage as Schulze.

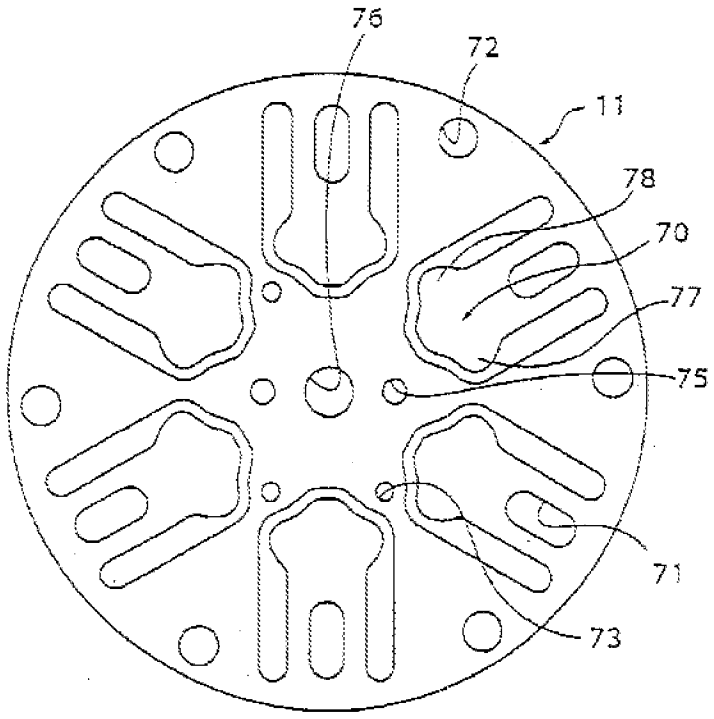
Claim Rejections - 35 USC § 103

17. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

18. Claims 2,3 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ikeda et al (US Patent 4,764,091 A) and in view of Une et al (PCT Publication WO 01/98657)

FIG.3



19. In Re claim 2, Ikeda et al discloses the increasing width of the median opening by virtue of the elliptical shape, and it also discloses the diminishing total width of the flexible vane up to the mid point of the elliptical opening however, it does not disclose the progressive increase thereafter.

20. Nevertheless Une et al discloses, with reference to Figure 3 depicted above, an increase in the total width in the top section of the vane (70).

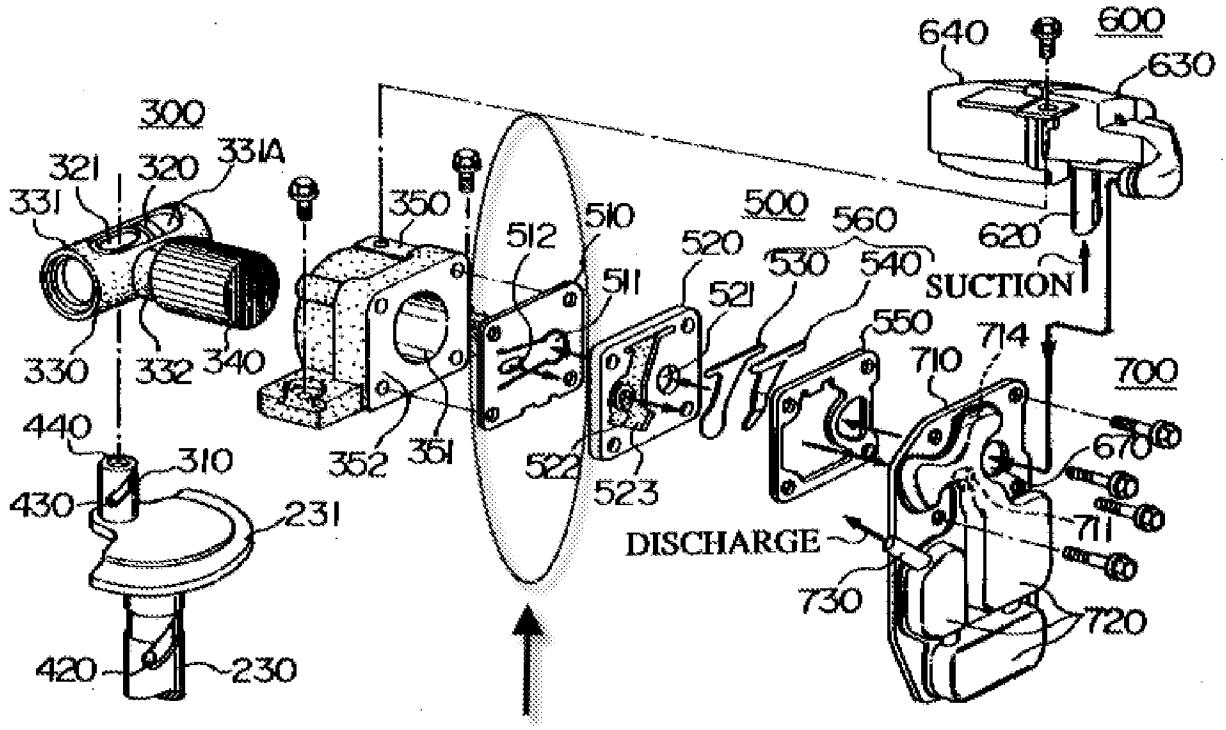
21. It would have been obvious to a person having ordinary skill at the time of the invention to modify the vane disclosed in Ikeda et al to have a larger sealing end portion as taught by Une et al for the following reason:

22. If the size of the suction port is larger than the width of the vane, the sealing end section of the vane would have to be made larger to completely cover the suction port. In addition, it would be logical to increase the with of the vane from the half way point of the elliptical opening to incorporate the increased size of the sealing end portion because the thickness L inherently starts to increase at this point. This further insures that there is a smooth outer edge to the vane, which relieves stresses related to sharp corners.

23. In Re claims 3 and 4 Ikeda et al modified by Une et al as applied to claim 2 disclose all the limitations of these claims. Note that the dictionary definition of the word “oval” is “egg shaped”.

24. Claims 2,3 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ikeda et al (US Patent 4,764,091 A) and in view of Hirano et al (US Patent 5,328,338 A).

FIG.6



25. In Re claim 2, Ikeda et al discloses the increasing width of the median opening by virtue of the elliptical shape, and it also discloses the diminishing total width of the flexible vane up to the mid point of the elliptical opening however, it does not disclose the progressive increase thereafter.

26. Nevertheless Hirano et al discloses, with reference to Figure 6 depicted above, an increase in the total width in the top section of the vane (511).

27. It would have been obvious to a person having ordinary skill at the time of the invention to modify the vane disclosed in Ikeda et al to have a larger sealing end portion as taught by Hirano et al for the following reason:

28. If the size of the suction port is larger than the width of the vane, the sealing end section of the vane would have to be made larger to completely cover the suction port. In addition, it would be logical to increase the with of the vane from the half way point of the elliptical opening to incorporate the increased size of the sealing end portion because the thickness L inherently starts to increase at this point. This further insures that there is a smooth outer edge to the vane, which relieves stresses related to sharp corners.

29. In Re claims 3 and 4 Ikeda et al modified by Hirano et al as applied to claim 2 discloses all the limitations of these claims. Note that the dictionary definition of the word “oval” is “egg shaped”.

30. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ikeda et al (US Patent 4,764,091 A).

31. In Re claim 6, Ikeda et al discloses the claimed invention except for the length of the high bending region being 50 % of the length of the flexible vane. Applicant's disclosure states that the range could be 50-60 % with a preferred value of 55 %. It would have been obvious to one having ordinary skill in the art at the time of the invention was made to chose a value of 50 %, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In Re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Conclusion

32. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: Oofuchi (US PGPub 2002/0141883 A1) discloses another symmetrical vane. Kandpal (US Patent 5,197,867 A) discloses another vane cut from a sheet similar to applicant's disclosure. Asaka et al (US Patent 4,582,469 A) discloses yet another configuration of a vane whose width decreases initially and increases subsequently.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DNYANESH KASTURE whose telephone number is (571)270-3928. The examiner can normally be reached on Mon-Fri, 9:00 AM to 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, George Nguyen can be reached on (571) 272-4491. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Dnyanesh Kasture
Examiner
Art Unit 4147

DGK
/George Nguyen/
Supervisory Patent Examiner, Art Unit 4147